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Acute Coronary Syndromes

PATHOPHYSIOLOGY OF MYOCARDIAL REMODELING IN SURVIVORS OF ST-ELEVATION MYOCARDIAL INFARCTION: INFLAMMATION, REMOTE MYOCARDIUM AND PROGNOSIS

Poster Contributions
Poster Hall B1
Sunday, March 15, 2015, 3:45 p.m.-4:30 p.m.

Session Title: From Cardiac Arrest, LV Failure to Myocardium Salvage
Abstract Category: 2. Acute Coronary Syndromes: Clinical
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Background: The significance of remote myocardium in the natural history of STEMI is uncertain. Cardiac magnetic resonance (CMR) depicts left ventricular (LV) dimension and pathology. Native T1 quantified by CMR (T1 proton relaxation time, milliseconds) is a fundamental tissue property determined by water content and cellularity.

Methods: We performed a prospective single center cohort study in invasively managed STEMI patients who underwent CMR 2 days and 6 months post-MI. Native T1 CMR was measured in remote and injured myocardium. Infarction was depicted on late gadolinium contrast enhancement imaging. Adverse remodeling was defined as an increase in left ventricular end-diastolic volume (LVEDV) ≥ 20% at 6 months. Major adverse cardiac events (MACE) were defined as cardiac death or hospitalization for non-fatal MI or heart failure.

Results: 300 STEMI patients (mean age 59 years, 74% male) gave informed consent (14 July 2011 - 21 November 2012). 288 (96%) STEMI patients had evaluable native T1 CMR and follow-up data (median duration 845 days). Infarct size was 18±14% of LV mass. Two days post-STEMI, native T1 in remote myocardium was lower than native T1 in the infarct zone (961±25 ms vs. 1097±52 ms; p<0.01). Remote zone native T1 was multivariably associated with incomplete ST-segment resolution (regression coefficient 9.42 (95% CI 2.37 to 16.47); p=0.009), the log of the initial CRP (3.01 (0.016 to 5.55); p=0.038) and the peak monocyte count ≤ 2 days post-MI (10.20 (0.74, 19.67); p=0.035). At 6 months, LVEDV increased by 5 (25) ml (n=262 patients). Remote zone native T1 was a multivariable predictor of the change in LVEDV from baseline (0.13 (0.01, 0.24); p=0.035). 39 (13.5%) patients experienced a MACE including 20 (6.9%) patients with a post-discharge MACE. Remote zone native T1 was an independent predictor of post-discharge MACE (hazard ratio 1.016, 95% CI 1.000, 1.032; p=0.048) including after adjustment for LVEF (p=0.032), LVEDV (p=0.053), and monocytes (p=0.036).

Conclusion: Remote myocardial tissue characteristics are temporally linked with acute reperfusion injury and inflammation and independently predict LV remodeling and longer term MACE in STEMI survivors.